The monk seal of the Pacific

By Judith E. King

Eingang des Ms. 22. 3. 1963

Seals are well known animals, particularly those of the colder Arctic and Antarctic waters. The Ringed, Bearded and Harp seals, and the Walrus, for example, live in the Arctic and rarely come far south. At the other end of the world the Ross, Weddell and Crabeater seals live on the Antarctic ice. Grey and Common seals are animals of more temperate waters, both including the British Isles in their range, and the latter also occurring on the German and Netherlands coasts. Where the distribution of seals inclines towards tropical waters, a cool current can usually be found occupying much the same area, and this can explain the southerly distribution of the Californian sea lion and the northern Elephant seal for example. Perhaps the only seals that can really be called tropical are the monk seals *(Monachus)*.

The three species of monk seals have widely different distributions, the Mediterranean monk seal *(M. monachus)* being found along the less inhabited coastal regions of the Black Sea and Mediterranean, and down the African coast as far as Cap Blanc. The West Indian monk seal *(M. tropicalis)*, now possibly extinct, lived in the Gulf of Mexico and on the islands of the Caribbean Sea. Most isolated of all, the Laysan, or Hawaiian monk seal *(M. schauinslandi)* lives on the islands of the leeward chain of the Hawaiian Islands.

Because of its distribution, it is not surprising that, of the three species, the Hawaiian animal was the last to be described. The Mediterranean seal was first named in 1779 from a specimen caught off the Dalmatian coast two years earlier; the West Indian seal was named in 1850, but scientific recognition did not come to the Laysan seal until 1905. In history too, this seal lags behind the others. The Mediterranean seal was known to the classical Greek writers such as Pliny and Homer and there are many legends attached to the animal; the West Indian seal was noted by Columbus in 1494, but there seem to be no records of the Laysan seal until 330 years later — in 1824.

The remoteness of the islands on which they live is undoubtedly the reason for this lack of records. The chain of Hawaiian Islands, near the centre of the North Pacific Ocean, stretches for nearly 2,000 miles, and Hawaii, at the south eastern end of the chain is about 2,000 miles from San Francisco. The Hawaiian chain can be divided into the Hawaiian Islands proper, fom Niihau to Hawaii, and the leeward chain from Nihoa (= Bird) Island to Kure (= Ocean) Island. (Fig. 1) The former are volcanic islands, increasing in height, from about 1300 feet to over 13,000 feet, as they decrease in age, Hawaii

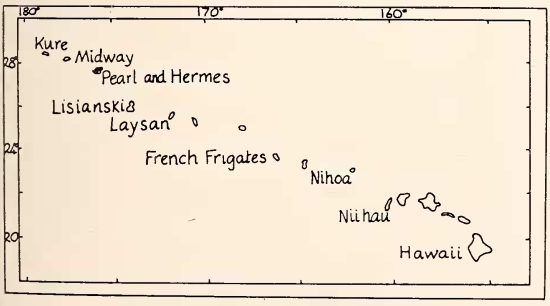


Fig. 1. Map of the Hawaiian chain of islands

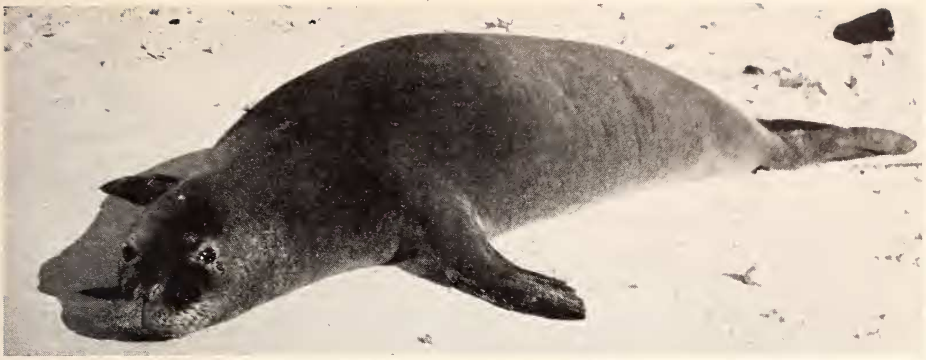
itself being the highest and youngest, and the only one with active volcanos. Of the leeward chain, Gardner, Necker and Nihoa Islands are volcanic, and only French Frigates Shoal has sandy islands surrounding the volcanic pinnacle; and the remaining islands are low coral atolls, with heights up to about 50 feet. The entire leeward chain of islands forms the Hawaiian Islands Bird Reservation, and only Midway and French Frigates Shoal are inhabited, the former by a U.S. Naval Station, and the latter by a U.S. Coast Guard Unit.

Necker Is. and French Frigates Shoal were the earliest discoveries of the leeward chain, both being found by the French explorer La Pérouse in November 1786. La Pérouse paid great attention to the discovery of these islands, naming the shoal in honour of his two ships and spending some time establishing its exact position because it was only the swift appreciation of the significance of the unexpected breakers that saved the ships from foundering and he mentioned that "it was very near being the termination of our voyage". He did not, however, record the presence of any seals. The remaining islands were discovered between 1789 and 1872.

Although there may have been earlier expeditions, the classical first reference to a sealing trip is that of the brig Aiona that set out from Hawaii in 1824, but there are no records of the numbers caught. There is some doubt about the authenticity of the numbers obtained by the 'Gambia', on which trip, in 1859, Midway was discovered. It is not proposed to go into the history of the sightings and countings of this seal in detail, as this has been adequately done before, but it is instructive to display the main records in tabular form. Although presumably numerous enough to have been exploited commercially up to about 1824, visitors to the islands for nearly a hundred years after this date saw only occasional animals, or perhaps small groups. Certainly the survivors of U. S. S. 'Saginaw' existed partly on the seals of Kure Id in 1870, but the crew of the wrecked 'Wandering Minstrel' saw no seals on Midway during the fourteen months they spent there in 1888–9. Until 1909, when the Bird Reservation was formed, the guano and feather by-products of the numerous colonies of sea birds were utilized, and the table indicates that it is from about this date that the gradual recovery of the seal colonies took place. Of recent years, much more attention has been paid to this seal and accurate counts have been made. It is very pleasing to be able to see the gradual increase in numbers and to know that this animal is not now thought to be in danger of extinction.

Dr. Hugo Schauinsland, who was director of the Bremen Museum and after whom the Laysan monk seal is named, spent three months on Laysan in 1896. While there he met Max Schlemmer who was in charge of the guano works and who had killed seven seals in the course of his 15 years on the island. The skull of one of the animals forms the type (Matschie 1905), and is in the Zoological Museum, Berlin (No. 32795), where there are also believed to be the facial regions of two other skulls collected at the same time. In the Bremen Museum there is a stuffed animal brought back from the same expedition.

Of typical Phocid appearance, the adult Laysan seal measures about 7 ft to 7 ft. 6 ins. (2.13–2.28 m) from the tip of the nose to the tip of the tail, females being slightly larger than males. When clean and newly moulted they are dark silvery grey dorsally, shading to a light silvery white or grey ventrally. The adult males are generally, but not invariably, darker than the females. During the course of the year the brightness of the new coat fades and the animals become much browner. Moulting of the old coat may take place between the middle of May and the middle of October in adult animals and until about the middle of November in subadults. Females do not moult until they have weaned their pups. Moulting starts at the anterior end of the body, round the face and neck, and then spreads along the ventral surface and sides, so that the back of the animal and the hind flippers are the last to change.



Figs. 2 and 3. The Laysan monk seal on the coral sands of Midway Island. Photos by courtesy of Dr. A. M. Bailey, Denver Museum of Natural History, Colorado, U. S. A.

The method of moulting is that common to Phocids in general, but is of the more drastic nature that has been particulary noticed in the Elephant seal. The old hair comes off in patches, held together by the outer layer of the epidermis, which is also shed. If a piece of this shed skin is examined the old hairs can be seen protruding on one side, and their roots on the other.

Although a number of pups have been tagged, hardly enough time has yet passed for there to be definite information about the age at which the seals first start to breed. It is thought that they may be sexually mature at about three years. The pups may be born at any time between the end of December and the beginning of June, although most births occur from the middle of March to the end of May. At birth the little seal is thin and active and can, if necessary, swim. It weighs about 36 pounds (16,3 kg), is 39 inches (100 cms) from nose to tail, and has a coat of soft black hair which it loses when it is between 30 and 40 days old. This post natal moult is of the ordinary kind, the hairs falling out individually, not attached to pieces of epidermis. The new coat, which has slowly replaced the black one is very much the same colour as that of the adult seal. Although slim when it is born, the young seal puts on weight very quickly, doubling its birth weight by the time it is about 17 days old, and

Fig. 4. Female Laysan monk seal with pup. (Photo: Dr. VERNON E. BROCK, Fish and Wildlife Service, Washington D. C.)

quadrupling it by about 37 days, so that by the time it is weaned it may weigh between 95 and 160 pounds (43-72,5 kg). The pup is suckled for about five weeks, and as the mother does not feed during this time she gets very thin. There is a tendency for the larger, fatter mothers to produce pups that grow quicker and moult faster than the pups of smaller mothers.

The mother seal takes care of her pup. She responds to any cries of distress, and protects it by placing her head and neck over its back. She is agressive towards other seals, and to humans too, until the pup is weaned. A lost pup will bleat loudly and plaintively until, guided by the sounds, its mother finds it.

The monk seals prefer to lie on the sandy beaches of their coral islands, often under the shade of the *Scaevola* bushes. More seals are on land during the afternoon, and they are probably crepuscular or nocturnal feeders. They feed on fish which they obtain from the floor of the comparatively shallow lagoons, and do not spend much time in deeper waters. Deep water is, nevertheless, no barrier to them, as they have been seen far from the islands, and, although they do not usually do so, there is a record of an animal reaching Hawaii. They are normally fearless of man unless actively annoyed, and on the few islands where they come into regular contact with men they tend to seek the quieter beaches.

Few animals have been kept in captivity, but those in the Waikiki Aquarium have been noted as being playful, and relatively friendly towards their keepers. Turtle inhabitants of the same pool were annoyed by the seals, and had to be removed, but after an initial period of fright, they got on well with a pilot whale.

Amongst the rest of the Pinnipedia, the monk seals are more closely related to the southern Phocids — the Weddell, Crabeater, Leopard and Ross seals. This relationship is indicated by combining them in the subfamily Monachinae, and some of the characters they share are: — the possession of only two incisors in each side of each jaw; the more horizontal position of the anterior nares; the hind flippers with the outer digits considerably longer than the inner ones, and the claws on all these digits reduced. There are various similarities in the behaviour and in the skeleton also, that indicate that the relationship is closer between these two groups of seals than it is between them and the northern Phocinae. The monk seals themselves are distinguished from the southern Phocids by their possession of four mammary teats and smooth, not beaded, whiskers, and it is curious that these two characters are only

otherwise found in the Bearded seal, *Erignathus*. The broad, heavy teeth of the monk seals distinguish them from all other seals, and small differences in the arrangement of the cusps make it possible to tell the teeth of the three species, one from another. Relatively few skulls of monk seals are available, and the little comparative work that has been done indicates that, in general, the Laysan and West Indian seals are more closely related to each other than to the Mediterranean seal. Similarly, although only a single, juvenile, Laysan seal skeleton has been examined, the same relationship predominates.

Table showing monk seal population on Hawaiian islands

	1824	1870	1888-9	1902	1911	1912-13	1923	1930	1936	1939-40
Ship	'Aiona'	'Saginaw'	'Wandering Minstrel'			'Thetis'	'Tanager'			
Kure		present					plenty			
Midway			occ. seen	occ. seen		groups 5—6				seen
Pearl + Hermes				some		ca 60	400*	68		
Lisianski				reg. seen		2				
Laysan				reg. seen	none seen	1				
French Frigates						none seen			5	
Reference No.	4.	12.	2.	4.	2.	2.	1.	2.	2.	3.

	1949	June 1950	1951	May 1951	June 1951	March 1954	Nov. 1954	Jan. 1955	May 1955	Feb. 1956	Spring 1957	Spring 1958
Kure	20—30		70				60				128	142
Midway	8	Few			24		25	26	30		71	76
Pearl + Hermes	100+	100		present	180		96				290	338
Lisianski		100		195	70	115	76		100		256	281
Laysan	20—30	50		174	119		60	101			233	326
French Frigates		8		9	12					32	35	43
Reference No.	2.	10.	2.	10.	10.	10	10.	10.	10.	10.	5.	9.

Note: occ. = occasionally; reg. = regularly; * 400 includes Ocean Id as well.

Summary

The account of this seal is taken from the references listed. — Monk seals are the only really tropical seals, and of the three species, the Laysan seal is the most recently discovered, and its distribution, history, and present population is noted. — A brief description of the seal, its life history and relationships is given.

Zusammenfassung

Mönchsrobben sind die einzigen wirklich tropischen Flossenfüßer, und unter den drei Species ist die Laysan-Robbe die zuletzt und erst spät entdeckte. Ihre Verbreitung, Geschichte und derzeitige Populationsgröße werden gezeigt. Eine kurze Beschreibung der Robbe, ihrer Lebensweise und ihrer verwandtschaftlichen Beziehungen wird gegeben.

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Archaic pattern in the horse and its relation to colour genes

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Eingang des Ms. 19. 5. 1963

Amongst horses in pre-war Holland it was very uncommon to encounter animals with colours other than black, brown, bay, chestnut, roan and grey. Only occasionnally some less common colours could be seen in imported horses, as for example on Russian ponies.

The scarcity of these uncommon colours may be the reason why until I came to Indonesia I had seen only a few horses with a backbone stripe and never yet the so-called zebra markings or tiger stripes on the legs. In Indonesia, especially on the isle of Timor, I noticed very often that horses with a yellowish or buffy bay coat colour combined with a black mane, tail and points, had a black eel stripe along the backbone. In addition they had the tiger striping on the legs, namely the transversal dark stripes across the back of the fore-arm and on the inside, but occasionnally also on the outside of the tarsal joint.

Later I noticed that the same pattern could also occur in mouse coloured horses in Indonesia. Once my interest had been roused to this phenomenon, I gradually became aware of the fact that this tiger striping is well known not only in the wild horse *(Equus przewalskii),* but also in the "reconstituted tarpan" and moreover it is rather a common trait in dun coloured horses.

Personally I saw it in Europe in the Highland Garron, the Norwegian fjord pony, in a few Welsh and Islandic ponies and an indication of it in a few Shetland ponies.